2005 Axel Service Manual

Rev NC

Table of Contents

Description	Page
Introduction	3
Front Suspension Terminology	4
Disassembly/ Assembly Instructions	8
Lock Out Troubleshooting Tips	13
Remote Lockout Service Instructions	14
Air Assist Troubleshooting Tips	16
Bushing Removal and Installation Instructions	17
Troubleshooting Chart	21
Axel Schematic and Technical Specifications	22
Axel Service Kit Chart	23

Contact Information

Answer Products Customer Service Department
28209 Ave. Stanford
Valencia, CA 91355

Toll Free: (800) 423-0273
Direct: (661) 257-4411
FAX: (661) 775-1798
E-mail: warranty@answerproducts.com
tech@answerproducts.com
Web site: www.answerproducts.com

INTRODUCTION

This manual is intended to guide the user through basic service of Manitou Axel front forks. Service is supported by the identification of common parts and assemblies that have been assembled into Service Kits. The purpose of this manual will be to describe conditions that may drive the need for service and to provide installation instructions for the kits.

Due to the time-consuming nature of suspension fork service, at this time our primary focus is to offer service kits that minimize the amount of downtime and labor involved.

Important information is highlighted in this manual by the following notations:

WARNING
Failure to follow WARNING instructions could result in severe injury or death to the person inspecting or repairing the suspension fork or the user.

CAUTION
A CAUTION a caution indicates special precautions that must be taken to avoid damage to the product.

NOTE
A NOTE provides key information to make procedures easier or clearer

GENERAL WARNING: Suspension forks by design can contain preloaded springs, gases and fluids under extreme pressure and warnings contained in this manual must be observed to reduce the possibility of injury or possible death. Following these instructions can help you reduce the risk of being injured. Any questions in regards to the information in this manual should be directed to Answer Products Customer Service at (661) 257-4411.

WARNING: Suspension forks uses preloaded spring(s) to provide compression spring resistance. This system must be relieved of preload prior to servicing. Failure to relieve air pressure could result in injury or possible death.

CAUTION: Suspension forks use precision machined aluminum and other soft alloy components. Using correct tools for assembly is essential to prevent damage.

FRONT SUSPENSION TERMINOLOGY

Air Cap – Top cap that threads into top of air/spring leg (this is the left leg of the fork as you are seated on the seat). Forks may be controlled with an air/spring or a coil spring. The air cap contains the Schrader Valve, which is used to control the spring rate or SAG of air forks.

Air Spring – A mechanism that is used to control the SAG of an air fork.

Arch – A support that connects the two outer lower legs of the casting so as to keep them moving in unison.

Black Nitrate Leg Coating – New coating for steel stanchion legs that reduces stiction.

Boss – The word used to describe an outer casting that has brake posts for V-brakes or cantilever brakes.

Bottom Out Bumper – A rubber or elastomer device that absorbs the shock that occurs when a suspension is compression to its limit.

Bushings – A cylindrical sleeve between a fork stanchion tube (inner leg) and a fork outer casting (slider), which facilitates the sliding movement between these two parts.

Coil Spring Air Assist – A new feature for 2005 that utilizes a full length coil spring and allows you to increase the spring rate of the fork by adding air as a booster to that coil spring.

Coil Spring – A coiled piece of metal that acts as a spring to help suspend a fork.

Compression – The phase of the suspension operation in which the wheel travels up, or travels closer to the frame. The suspension forks reaction to a bump in the trail.

Compression Damping – Restriction of the rate that the suspension compresses under load.

Convertible Travel – A system used to alter the travel of a suspension fork. It requires moving a travel clip on the compression rod to a different position. This operation is accomplished by disassembling the fork and physically moving the travel clip on the compression rod.

Crown Steerer Assembly – the stanchion legs (inner legs), the fork crown, and the steer tube pressed together as one assembly. This assembly is then finished by adding all of the fork internals and then outer casting (slider).

Damping – A function that modifies the rate of suspension compression or rebound.

Detent – An indentation that causes a rotating adjuster to stop at fixed increments.

Drop Out – The end of an outer casting (slider) where the wheel attaches.

Dust Boot – Usually a piece of rubber in the shape of a cylinder with baffles to allow it to compress as the fork compresses through its travel. Its function is to help keep dirt and water from getting into the inner legs of the fork.

FFD – Fluid Flow Damping. A Manitou patented low cost oil damping system. The compression damping is non-adjustable and the rebound damping may be non-adjustable or adjustable damping.

Fork Crown – The component that joins the stanchion tubes (inner legs) to the steer tube of the fork.

FRONT SUSPENSION TERMINOLOGY (CONT.)

Hydraulic Fork Oil – Oil used in suspension designs to provide damping. It has special characteristics that determine how it reacts when exposed to compressed air, how it changes viscosity when its temperature changes, and how it moves through valves.

Hydraulic Lock Out – a condition caused when the mixture of air and damping oil is out of balance. It is caused when there is too little air space in a chamber, not allowing the fork to compress through its travel.

Infinite Travel System (IT) – A handle-bar mounted air travel adjust system that allows the rider to change the fork travel (and ride height) without a spring rate change. The travel can be changed from full compression to full rebound and at any place in between.

Lock Out – a special function that restricts the compression of the fork from moving. It is generally controlled by an external knob that is activated when a rider does not want the fork to move, thus eliminating extra energy needed to overcome the bobbing forces of the fork.

MCU – (Micro-Cellular Urethane) Special urethane that is filled with tiny air cells that act like springs when the elastomer is compressed.

Micro Lube – Lubrication system that is operated by injecting small quantities of grease directly into ports that are inserted into outer casting legs. This enables the lubrication of the fork without having to disassemble it.

No Boss - The word used to describe an outer casting that has no brake posts for V-brakes or cantilever brakes. This casting is to be used for disk brakes only.

Oil Damping – A system that uses the resistance to oil flow through holes in a valve to provide a means to alter the rate of suspension compression or rebound.

Oil Level – The level of damping oil needed for the optimal damping performance of a suspension. It is measured as the air space distance between the top of the stanchion leg (inner leg) and the height of the oil inside of the leg. The fork must be completely extended in order to get an accurate measurement.

O-Ring – A soft, flexible neoprene or Buna rubber ring with a round cross-section, which is used for sealing and retention.

Oil Weight – A description of the relative viscosity of oil, such as hydraulic oil. Oil with low weight numbers (5wt or 7wt) flows through the valving with less resistance than higher weight numbers (10or 15 wt).

One Point Five Standard - 1.5 inch interface standard for frame head tubes, headset, cups, stem, and steer tubes which allows for the lightest weight and strongest design in 170mm single crown forks. This design greatly improves the control and steering precision of the fork. It is used predominately on forks with longer travel and the intended use is for more hardcore, extreme riding.

Outer Casting – (see Slider)

Preload – A condition of compressing a spring or elastomer before the operating loads are put on the suspension, so that it provides a stiffer spring rate.

FRONT SUSPENSION TERMINOLOGY (CONT.)

Piston – In front suspension, the part of the damper that slides back and forth inside of the damping leg that houses the valves. It can also refer to the air piston in the air/spring assembly that slides back and forth compressing the air, thus causing a change in the spring rate of the suspension.

Porosity – The condition or property of having pores in a material that will allow gas or liquid to pass through it.

Platform Plus Damping – A new damping system found on 2005 Rear shocks (featured on Metel and Radium's). This system will establish a pedaling efficiency platform similar to SPV, but is done through unique valving that is not adjustable (helps in bump control).

Rapid Travel II, Wind Down – Systems that are used to control the travel of suspension forks. Also known as RTII, and WD. RTII is used for the specific purposes of controlling the travel in two conditions: climbing and descending. WD is an incremental travel adjustment between to set limits and does not affect the spring rate of the fork as severely as RTII.

Quad Ring seal – New seal that replaces standard o-rings in designs that require more efficient air and oil sealing methods.

Rebound – The phase of the suspension operation in which the wheel returns to its original position on the ground after compression.

Rebound Damping – Restriction of the rate that the suspension rebounds when the compression load is relived.

Remote Lock out system – A handle-bar lever actuated system that controls the lock out function on front and rear suspension products.

Reverse Arch Technology – Also known as RA. It is a system that is designed to move the arch of a fork to the backside of a fork, rather than the conventional front position. It was designed to provide greater rotational torque strength to an outer casting (slider), without adding additional weight to the fork.

Sag – The amount a suspension fork compresses at rest with a normal load (rider's weight).

Schrader Valve – Valve used to introduce air into a chamber.

Seal – A part, usually neoprene rubber or Buna, that keeps contaminants out and/or working fluids in.

Semi Bath – A lubrication system that uses a lubricating oil to keep the bushing surface and stanchion legs (inner legs) as friction free as possible during movement of the stanchion legs.

Spring Rate – The rate at which the resistance of a spring increases as it is compressed.

SPV – (Stable Platform Valve) new damping system that allows the rider to set the pedaling platform that he desires to pedal most efficiently in all situations. It is dependent on the pressure that the SPV valve experiences from the movement of the wheel vs. the terrain and the platform that is set by pressure introduced to other side of the SPV valve through changes of air pressure working on the damping oil.

SPV Evolve – The latest version of SPV damping technology that has increased its performance with modifications to the original design.

FRONT SUSPENSION TERMINOLOGY (CONT.)

Slider/Outer Casting – The tube (outer casting leg) of the suspension fork that0. remains fixed to the wheel. It slides up and down on the stanchion leg (inner leg).

Stanchion Clamps - (Double-Triple Clamps) the portions of the fork crown that clamp around the stanchion legs above and below the head tube of the bicycle frame on specific long travel applications.

Stanchion Legs – The suspension tube (inner leg) fixed to the fork crown. It remains stationary during the operation of the suspension.

Steer Tube – The long cylindrical tube that extends from the top of the fork crown. Its function is to be inserted into the bicycle head tube and attach the suspension to the bicycle frame.

Thru Axle – (Hex-lock) A device used for mounting a thru axle hub to special outer legs that are not made for standard quick release hubs. Manitou's Hex-lock (thru axle) system is a special patented system utilizing a hex shaped end that increases the stiffness of the fork and reduces slippage in the joint between the axle clamps and the axle.

Top Out Bumper – A rubber, coil spring, or elastomer device that absorbs the shock that occurs when the load is taken off a suspension so that it is allowed to rebound to its limits

TPC – (Twin Piston Chamber) a patented damping system that has independent pistons for rebound and compression. The system utilizes a mixture of air and oil in the damping leg of the fork to enhance the damping performance.

TPC+ - A variation of TPC that has added a floating piston to the compression damper to enhance the performance of the compression damping under the load of bigger hits.

Travel – The amount that a wheel moves between the most compressed and the most extended states of the suspension

Viscosity – A description of how a liquid flows. Liquids with higher viscosity are thicker flow less easily or quickly than liquids with low viscosity. This has an affect on the damping speeds of rebound and compression.

Volume Control – A new system designed to work with SPV as a control of the compression ramp up rate of the fork. It has a range of adjustments from linear to very progressive.

Wiper Seal – A rubber material that is used as a seal to keep dirt and water out of the outer casting legs. It is not designed to keep air pressure or extreme oil pressure in. Manitou has the new Evil Genius wiper seals.

2005 Axel Forks Disassembly and Rebuild Instructions

Disassembly Instructions

Removal of Outer Casting

1. From the left leg dropout (Left when sitting on the bike), use a 4mm hex wrench to remove the compression rod screw.
2. From the right leg dropout, if the fork has adjustable rebound, the knob will need to be removed. Remove the 2mm hex screw inside the knob and remove the knob.
3. Use a 8mm hex wrench to turn the damper **clockwise** until it can be pushed into the casting.
4. Remove crown/steer/inner leg assembly from the outer leg casting.

Bushing Removal & Installation

Please refer to section on Bushing Removal & Installation.

Removal of Spring and Compression Rod Assembly - Non-Wind Down Travel Adjust Forks

WARNING This fork uses a preloaded coil spring provide spring resistance. The spring must be relieved of its preload prior to servicing. Failure to do so could result in injury or possible death.

1. Turn spring preload adjuster knob counter clockwise until it stops. Remove 2mm hex screw on spring preload adjuster knob and remove knob on the top left side of the fork.
2. Remove preload adjuster using 18mm socket.
3. Compress fork and remove the spring preload and spring assy.
4. Remove rubber bumper and clip on compression rod.
5. Turn crown/steer upside down to allow the comp rods to fall out of the inner legs.

Removal of Spring and Compression Rod Assembly - Wind Down Travel Adjust Forks

1. Turn travel adjust knob (clear plastic knob on top of the left side of the crown) in a counterclockwise direction until it stops. This insures that the fork is in its longest travel and reduces any spring preload on the fork.
2. Remove the 2mm Allen screw from the knob. Use a 28mm socket to unscrew the top cap assembly from the crown.
3. Pull spring out of inner leg. If spring will not come out, you must take the outer casting off of inner legs (refer to Removal of Outer Casting instructions). Then remove the end cap from the bottom of the left leg and remove the Wind Down compression rod assembly and spring as a single unit through the bottom of the leg. You will find that on earlier production fork models, that there is a nylon washer at the top of the compression rod assembly that is holding the spring in place. Hold the spring in one hand and the compression rod assembly in your other hand and pull the apart from each other at a slight angle to each other. Once you have the two apart, remove the Allen bolt on top of the compression rod with a 4mm Allen wrench and remove the nylon washer (Fig 2). Re-install the bolt without the washer, it will not affect the operation of the Wind Down mechanism and insure that you will not have to take the whole fork apart in the future to change ride kit springs. (Note: the spring that you remove should have another spring (booster spring) intertwined within it)

Removal of Compression Damping Assembly

Forks with FFD (non-adjustable) Damping

1. Remove top leg cap (FFD Assy) on right hand side using 27mm socket.
2. Pour old oil out of the top of the fork, then compress fork upside down over oil drain pan 3-5 times to get oil out from under rebound piston and discard appropriately.

Forks with Adjustable Compression/Lockout Damping

1. Remove the 2mm fixing screw on top of the damper knob on top right side of the fork.
2. Remove 2 balls and springs from inside the top cap.
3. Unscrew the compression damping assembly using a 24mm socket.
4. Pour old oil out of the top of the fork, then compress fork upside down over oil drain pan 3-5 times to get oil out from under rebound piston and discard appropriately.

Removal of Rebound Damping Assembly

1. Unscrew Damper end cap from the bottom of the right leg and then pull out the rebound damper.

Assembly Instructions

Assembly of Rebound Damping Assembly

WARNING All leg caps for Damper and Spring systems must be properly tightened prior to use. Failure to do so could result in injury or possible death.

1. Install rebound damper into bottom of right leg and tighten per the Axel Schematic and Torque Specification Table. Slide the black rubber bottomout up the shaft until it contacts the damper cap. This will assist later during assembly of the outer leg casting to the damper shaft.

Assembly of Compression Damping Assembly - Non-Adjustable FFD

WARNING All top caps for Damper and Spring systems must be properly tightened prior to use. Failure to do so could result in injury or possible death.

1. Put a little bit of Prep M grease (Ref Answer Products PN 85-0031) on o-ring found on the lower piston of the FFD assembly.
2. Install the FFD Assy into the top right hand of the crown/steer using a 27mm socket. Tighten per the Axel Schematic and Torque Specification Table.

Assembly of Compression Damping Assembly - Adjustable Compression/Lockout

WARNING All top caps for Damper and Spring systems must be properly tightened prior to use. Failure to do so could result in injury or possible death.

1. Fill right leg with damping oil using 5wt Motorex fork oil (Ref Answer Products PN 85-0023) to the height noted in the Axel Schematic and Torque Specification Table. Cover the opening at the top of the right leg of the crown/steer with a rag and cycle the fork six times. Recheck oil level and add/drain to meet the level requirement.
2. Put a little bit of Prep M grease (Ref Answer Products PN 85-0031) on the urethane or brown rubber o-ring found on the lower piston of the Lock out assembly.
3. Twist the Hex shaped aluminum shaft that sticks up from the top cap counter clockwise until it stops (the system is completely open to oil flow at this point).
4. Using a motion like screwing in a screw. Twist the assy. and apply a little pressure to insert the piston part of the mechanism past the threads at the top of the inner leg. Then push the assy. into the leg until the threads on the cap intersect the threads inside the inner leg, screw the cap. Tighten per the Axel Schematic and Torque Specification Table.
5. Once the cap is tightened, twist the Hex shaped shaft clockwise until it stops (this is the locked out position). Insert the springs into opposite holes in the top cap and then place the ball bearings on top of the springs (place a little dab of grease on spring to hold ball bearing in place).
6. Place the adjuster knob onto the hex shaped aluminum shaft and seat it onto the top cap and ball bearing. Position the adjuster cap so that the lever part of the cap is at the farthest point to the back of the crown.
7. Insert 2mm fixing screw and tighten to secure the knob. Twist the knob counter clockwise to activate the fork suspension. Compress the fork several times to circulate the oil through the system and then activate the Lock out system by moving the lever clockwise to its stopping point at the back of the crown. The fork should have approximately 5 mm of progressive travel before it locks out.

Note: This system is a combination of adjustable compression damping that becomes a lock out. It is fully active when the lever is facing all the way forward (counter clockwise) and locked out when the lever is facing all the way towards the back of the crown (clockwise).

Installation of Spring, Compression Rod Assembly, and Outer Leg Casting - Non Wind Down Forks

WARNING All top caps for Damper and Spring systems must be properly tightened prior to use. Failure to do so could result in injury or possible death.

WARNING When installing the outer Leg Casting to the Crown Steer Assy, Compression Rod bolts and Damper Shafts must be properly tightened prior to use. Failure to do so could result in injury or possible death.

1. Screw the compression rod assembly into the crown/steer assy. Make sure that the comp rod that accepts the 4mm screw is installed in the left leg. Tighten per the Axel Schematic and Torque Specification Table.
2. Remove rubber fork boots from the casting and slide them onto the inner legs of the crown/steer assy.

3. Lightly grease the bushings on the inside of the outer leg casting and on the lower portion of the inner legs below the boots using a thick grease such as Motorex Bike Grease 2000.
4. Grease spring heavily with Motorex Bike Grease 2000. Install the spring preload and spring assy into the crown/steer assy.
5. Tighten preload adjuster using 18mm socket and tighten per the Axel Schematic and Torque Specification Table.
6. Insert 2mm hex screw into spring preload adjuster knob and install knob on the top left side of the fork.
7. Press inner leg assembly into outer leg casting until comp rod contacts casting.
8. From the left leg dropout, use a 4mm hex wrench to install the compression rod screw and tighten per the Axel Schematic and Torque Specification Table.
9. From the right leg dropout, use a 8mm hex wrench to turn the compression damper **counterclockwise** until it screws into the casting and tighten per the Axel Schematic and Torque Specification Table.
10. Slide fork boots down and snap over dust seal flange.
11. Lubricate the inner legs through the Microlube ports using Prep-M grease.

Installation of Spring, Compression Rod Assembly, and Outer Leg Casting - Wind Down Forks

WARNING All top caps for Damper and Spring systems must be properly tightened prior to use. Failure to do so could result in injury or possible death.

WARNING When installing the outer Leg Casting to the Crown Steer Assy, Compression Rod bolts and Damper Shafts must be properly tightened prior to use. Failure to do so could result in injury or possible death.

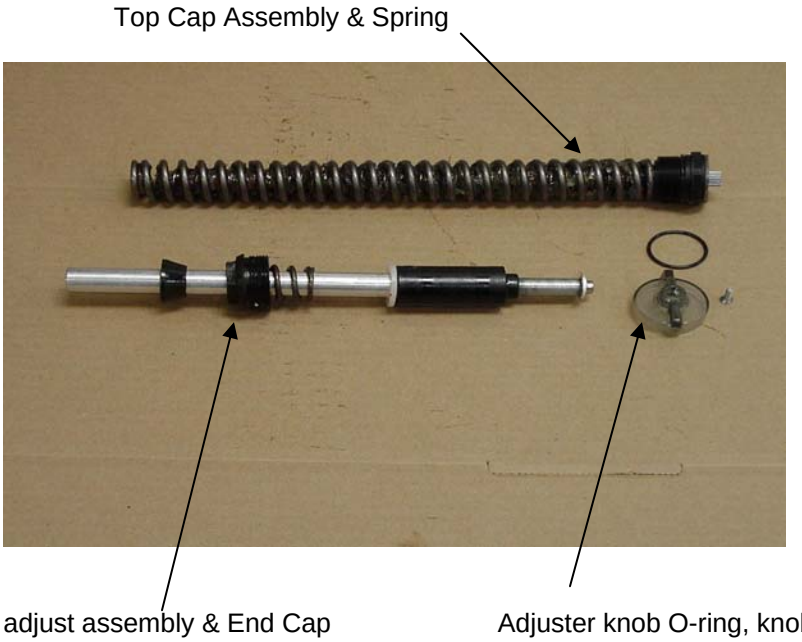
1. Drop the compression rod into the crown/steer assy. Make sure that the comp rod accepts the 4mm screw is installed in the left leg.
2. Remove rubber fork boots from the casting and slide them onto the inner legs of the crown/steer assy.
3. Lightly grease the bushings on the inside of the outer leg casting and on the lower portion of the inner legs below the boots using a thick grease such as Motorex Bike Grease 2000.
4. Optional Ride Kits - If you need to adjust to overall ride characteristics either softer or firmer, purchase and/or install as follows (Kit Part Numbers can be found in the Service Part section of this manual):

    - Soft - Remove the Booster Spring
    - Firm - Purchase Firm Ride Kit and install the Booster Spring
    - Extra Firm - Purchase Extra Firm Ride Kit and install the Booster Spring

        1. To remove the booster spring from the main spring; grasp the flat end of the booster spring with a pair of needle nose pliers and twist it in a clockwise direction to unscrew it from the main spring.
        2. To install a booster spring into a main spring catch the flat end of the booster spring under the flat end of the main spring and twist it counterclockwise into the main spring. Make sure that the booster spring is threaded all of the way down into and contained by the main spring. Before inserting it back into the inner leg.

5. Generously grease the spring and insert it into the inner leg. The end of the spring needs to seat onto the top of the compression rod.
6. Insert the wind down top cap assembly into the spring; the "D" shaped portion of the adjuster assembly must fit into the "D" shaped end of the main spring. Screw the assembly into the inner leg and tighten per the fastener torque guide at the end of this manual...
7. Install adjuster knob and 2mm hex screw. Holding the comp rod, turn the knob counterclockwise until the knob stops. This insures that the fork is in its longest travel position. If the travel indicator arrow on the crown is not lined up with the maximum travel point on the indicator dial, turn the knob counterclockwise until the indicator point to maximum travel. Retighten the compression bolt per the fastener torque guide at the end of this manual.
8. Press inner leg assembly into outer leg casting until comp rod contacts casting.
9. From the left leg dropout, use a 4mm hex wrench to install the compression rod screw and tighten per the Axel Schematic and Torque Specification Table. .
10. From the right leg dropout, use a 8mm hex wrench to turn the compression damper **counterclockwise** until it screws into the casting and tighten per the Axel Schematic and Torque Specification Table.
11. Slide fork boots down and snap over dust seal flange.
12. Lubricate the inner legs through the Microlube ports using Prep-M grease.

Wind Down Travel Adjust Assembly



Remove Nylon washer that rests on top of aluminum washer

4mm recessed Allen bolt

Lock Out Troubleshooting Tips

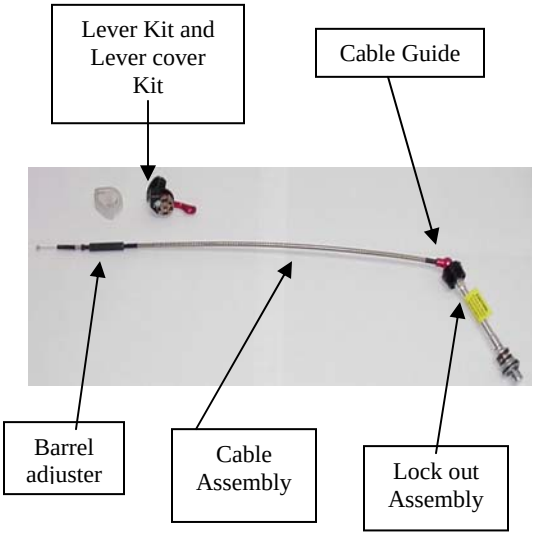
1. Installation of Lock out Compression Damping System
   - Check the o-ring that is installed around the lower piston on the damper shaft for tears or deformation. Replace it, if it is damaged. This is the most common reason why the Lock out system will not function.
   - Check the level of oil in the inner leg. The oil level may be a little high, but never low. The oil level must be high enough to cover the window that opens and closes on the damper shaft.
   - Make sure that the oil flow window on the lower portion of the damper shaft, positioned right above the piston, opens and closes when you move the lock out knob from open to close.
   - Inspect the rubber o-ring that is around the threaded portion of the cap that screws into the inner leg of the fork. This o-ring should not have nicks or tears in it and should fit tightly around the cap.
   - Make sure that when installing the Lock out system into the fork leg that you follow this procedure: Put a little bit of Prep M grease on the urethane o-ring, make sure that that the oil flow window is open using a motion like screwing in a screw. Twist the assy. and apply a little pressure to insert the piston part of the mechanism past the threads at the top of the inner leg. Then push the assy. into the leg until the threads on the cap intersect the threads inside the inner leg, screw the cap in and do not use any tools to over tighten the cap. Once the cap is tightened, compression the fork several times to circulate the oil through the system and then activate the Lock out system by moving the lever to the other position. The fork should have between 2 & 5mm of progressive travel before it locks out.

2. Troubleshooting

- If the Lock out does not lock out properly, go back through the steps listed above.
- If the o-rings are damaged on the Lock out piston, replace them with **P/N 062594(urethane 1998-2003 Mars, SX, & Skareb Lock outs), 065261 (04/05 Skareb Lockouts)** and **02/03 Black 100/120mm Lock outs**, and **040315 (Axel's).**
- If the oil level is low, check to see if there is evidence of leaking at the Rebound Damper. If so, replace the Rebound Damper assembly and retry the Lock out. The oil level may be low if you are upgrading a standard Compression Damping system with the Lock out system. In this case, make sure the oil level is at the correct level before trying it again. If there are signs of oil leaking around the top of the Lock out system, check the rubber o-ring (**040524**) and replace if needed. If the window does not open or close when the knob is moved, replace the entire Lock out assembly.

Remote Lock Out Service Instructions

Complete Remote Lock out Assembly



There are (5) Service kits available for each fork model that utilizes a Remote Lock out.

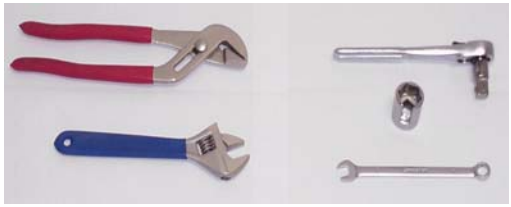
1. Lever assembly
2. Lever Cover
3. Cable assembly
4. Cable guide
5. Lock out assembly

*Reference to these kits may be found in the Service Parts Matrix

Instructions for removing assembly from fork

1. Unscrew barrel adjuster in a counterclockwise direction until it stops.
2. Remove Lever cover by squeezing the two plastic prongs together on the under side of the lever and pulling the cover in an upwards direction from the lever assembly.
3. Pull on Black cable ferrule nearest to lever and pull cable assembly from the groove in the Lever assembly, thus releasing cable from lever. Unhook cable end from lever.
4. Unscrew the top cap of the Lock out assembly from the fork crown using socket (Answer p/n: 83-2503) or an adjustable wrench.
5. Pull Lock out assembly out of crown by twisting the assembly like unscrewing a screw and applying an upward pressure. Slowly pull assembly out of crown and watch out for some excess damping oil to come out of inner leg as the piston at the end of the assembly comes out of crown.

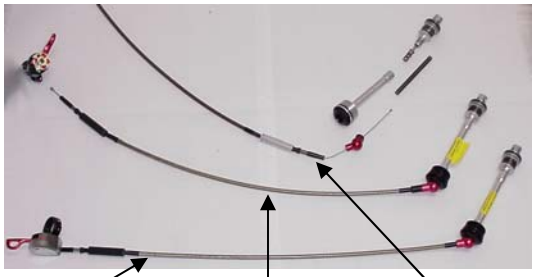
Tools needed to service assembly



Adjustable Pliers
Adjustable Wrench
Socket Wrench
22mm Socket W/cut out
10mm open end wrench

Special Note: It is important to periodically remove the Lever cover and using air pressure, blow out any dirt or moisture that has accumulated in the mechanism. Then add a small amount of a "Dry" Lubrication to the moving parts.

Steps For Cable Disassembly



Tool Placement to unscrew upper shaft assembly from lower assembly (Figure A)

Cable hook up connection (Figure B)

Cable Replacement Instructions

1. Step 1: Lock out assembly should be out of fork at this point.
2. Step 2: Cable assembly should be out of Lever assembly
3. Step 3: Look at tool placement in Figure A. It is recommended to use the Adjustable Pliers to grasp the flange of the lower assembly right above the coil blow off spring. Use a 10mm open end wrench on the flats of the upper assembly just below the top cap. Hold the flange with the Pliers and turn the 10mm wrench in a counterclockwise direction in order to unscrew the upper and lower assemblies.
4. Separate the two assemblies and unhook the cable end from the eye hook as shown in Figure B.
5. Pull the cable out through the top cap and red cable guide. There will also be a 75mm spring inside of the upper shaft. This spring provides the tension for the cable when you move the Lock out lever from the Lock position to Unlock position. The inner cable runs through the center of the spring.

Cable Installation Instructions

1. The inner cable is not removable from the cable assembly. The entire cable assembly must be replaced. Install the new cable assembly by reversing the Disassembly the instructions.
2. Slide the inner cable through the red cable guide, the top cap, and down through the spring. (Be sure to put a little bit of the Prep M grease on the spring before putting it back into the upper shaft assembly.)
3. Push the cable assembly together, forcing the inner cable to stick through the spring and then out through the end of the upper shaft assembly. (See Figure C). Hook the cable end into the eye hook and then pull on the cable assembly to pull the two shafts together. Tighten them together snuggly.
4. Check oil level in fork leg (refer to oil level heights in fork spec sheets). Install Lock out assembly into the fork leg and tighten top cap to proper torque.
5. Re-install the other cable end into the Lever assembly, and then put the lever cover back on to the Lever assembly. You may have to pull the cable assembly away from the housing of the lever assembly to expose the inner cable, so that you can slide the cover into its proper position.

Air Assist Trouble Shooting Tips

The root cause of the air leaking from the left leg of the fork (the side with the Schrader valve on top) and blowing out the seal at the top of the fork leg is that the either the end seal on the leg is bad or the seal on the compression rod is bad. Below are some steps to follow in order to trouble shoot this issue and potentially resolve it.

1. It is difficult to visually determine from the out side of the fork what problem you are having. So you need to remove the casting and check a couple of other areas.
2. Once the casting is off, try pumping up the left leg with about 50psi. If it blows out immediately, this means that the seal around the compression rod piston is bad. This can be changed out with a new Quad ring (p/n: 066398). Your assembly will probably have an o-ring on it.
3. Just as with air pistons, you want to coat the threads of the inner leg and the Quad ring with Prep M grease, and then twist the assembly as you put force on it to get it past the threads of the inner leg. It is also important to add the air piston oil (20/50wt) (about 3-5cc's) through the top of the inner leg prior to pumping it up.
4. If the air does not immediately pass from the inner leg, I recommend that you put that end into a bucket of water and see if any air bubbles are produced. If the bubbles are seen, check both the o-ring seal and the end cap seal on the fork leg.
5. If you get no bubbles, I would put some pressure on the compression rod in a side ways manner to side load that shaft. If air is released, it points to the hole in the casting being off center.
6. In this case, you need to change the casting.

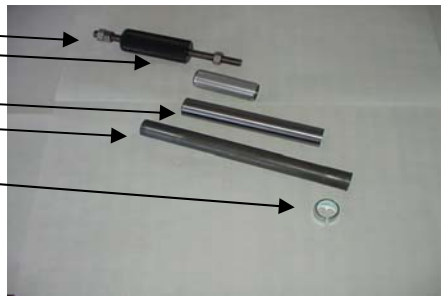
Note: The maximum recommended air pressure to be used with Air-Assist is 40 psi. and you should not exceed 50 psi. For each increase of 10 psi you raise the spring rate one level, ie 20psi is equal to a medium spring rate. If you can not achieve the spring rate you desire with in this range then you will need to upgrade to a firmer main spring.

Bushing Removal & Installation

Bushing Removal
(For Axel Super and Elite only)

(Note: use appropriate removal ring that corresponds to the leg diameter of the fork being repaired)

Leg Diameter	Answer Kit #
25.4mm (1”)	85-5191
28.6mm (11/8”)	85-5189
30mm	85-5194
32mm	85-5192

Bushing Removal Tool Components A. Slide Hammer B. Threaded Handle C. Slide D. Threaded Shaft E. Removal Ring	
Bushing Removal Tool Assembly	

Bushing Removal (CONT.)

Bushing Removal Instructions

A. Install 25.4mm Removal ring on the shiny, smaller diameter threaded shaft. Be sure to install the ring with the tapered, chamfered end first, followed by the long slide tube. This tapered end leads the tool through the bushing.

B. Start the procedure by removing the Dust/Wiper seal with a screwdriver, prying it out.

C. Insert Removal tool past the upper bushing and then stop. It is important to pull one bushing out at a time. Push the slide on the threaded shaft down towards the removal ring. Hold the casting with one hand and the slide hammer with your other hand. Now move the slide hammer in a motion away from the casting and repeat this action until the bushing comes out.

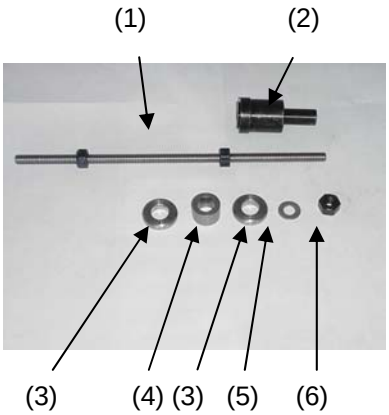
D. For all other leg diameters: use the larger diameter (dark colored) threaded shaft and repeat steps A-C.

Bushing Installation

(Note: Sizer kits listed in above chart contain the sizers needed for each specific leg diameter.)

Bushing Installation Tool Components

1. Installation Mandrel
2. Threaded Rod w/nuts
3. Sizer rings
4. Spacer
5. Washer
6. Nut



Bushing Installation (CONT.)

Bushing Installation Tool Assembly With weighted handle	
When selecting sizer rings to install bushings, choose the two rings that are in the middle of the size run to start with. 1. Assemble installation tool as shown in picture above. Each leg diameter kit has all of the needed pieces to remove and install bushings for forks with serviceable bushings. Some of the kits come with gauges to tell you how far to drive in the lower bushings. Upper bushings are driven in as far as the stop in the top of the casting will allow. The general rule of thumb is that the lower bushings must not be driven any deeper than 5" into a casting leg. If they do go deeper, call Customer Service at Answer Products – 800-423-0273 for a new outer casting. 2. Always assemble Mandrel with the larger diameter sizer ring being placed on the mandrel first, then the spacer, the next largest sizer ring, followed by the washer and the nut to hold it in place. Be sure to lock the nut above the Mandrel and below the Mandrel against each other.	
3. Replace the lower bushing (bushing with a thicker wall diameter) first. Place a small amount of Prep M grease onto the sizer rings to help the rings come through the bushings when pulling them out. Slide bushing onto Mandrel until it stops. Apply a bead of Red Loctite all the way around the outside of the bushing. Hold casting on top of bench with a rag under the end of the legs and insert installation tool with bushing into casting leg.	

Bushing Installation (CONT.)

4. Slide weighted handle onto end of threaded rod and tap rod into casting with rubber Mallet until proper depth is achieved. If using depth gage, slide gage onto rod before installing weighted handle and let it settle on of Mandrel. Tap rod until appropriate line on gage is even with top of casting leg.

5. Remove weighted handle and gage (if applicable).

6. For sizing of the lower bushing:

7. Use slotted top cap from sizer kit and set it into the top of the casting leg, straddling the threaded rod. Spin the extra nut with washer down to the top cap and using a wrench, socket, or speeder wrench, tighten the nut in a clockwise direction. This will cause the Mandrel to be pulled through the bushing, thus sizing it. Keep turning the nut until the tool is all the way through the bushing and can be pulled out of the leg.

8. To install top bushings, repeat steps B-E. Note that the top bushing gets inserted until it stops against the step inside of the casting. The extra sleeve that comes with the sizer kit is used to space the top cap off of the casting, so that there is enough room to pull the sizers out of the casting without bottoming on the cap.

9. If you find that the bushings are too tight after installing them, use the sizer Mandrel that does not have a stop on it to hold the bushing while installing it into the casting. This is available in the 25.4mm leg kit (85-5191) to go back in and resize the bushings.

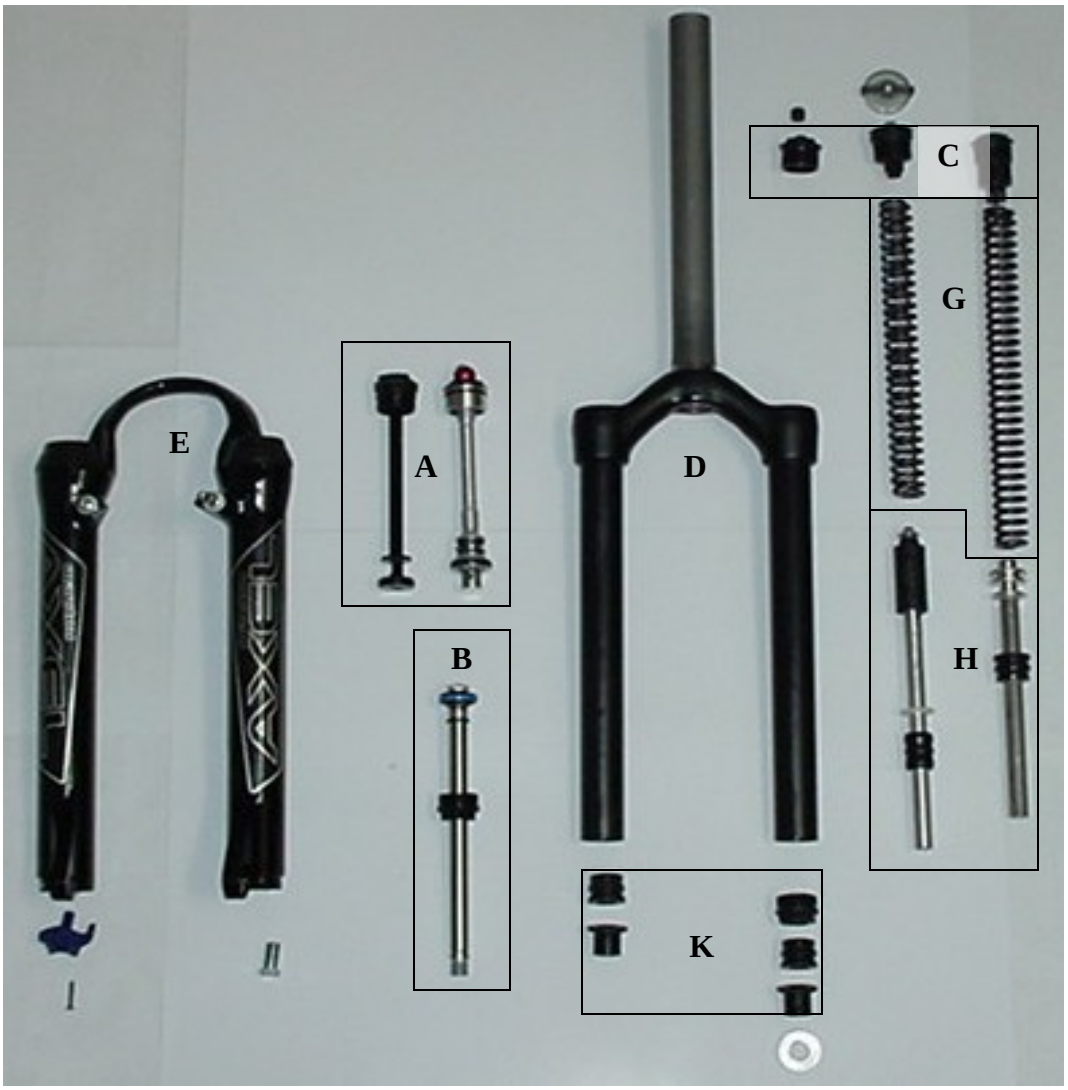
10. To resize bushings, Choose the next larger size rings and repeat the above process.

11. When satisfied with the results, reinstall Dust/wiper seals and then reassemble fork

Troubleshooting Chart

Symptom	Cause	Solution	Service Manual Page
Oil leaks from Wiper Seals	Seal not seated properly	Remove Casting from Inner Legs, reinstall or replace seals	9
	Nicks or scratches on inner legs	Replace Crown/Steerer/Inner Leg Assembly	9
	Wear	Remove Casting from Inner Legs, reinstall or replace seals	9
Oil leaks from bottom of Casting	Rebound damper shaft leaks	Replace Rebound Damping assembly	10
	Rebound damper shaft O-ring damaged	Replace O-ring on threaded end of Rebound Damping assembly	10
Lack of Travel	Tight Bushings	Replace outer leg	9
	Hydraulic lock out	Replace Rebound Damping assembly	10
	Damper oil volume	Check oil level, Replace Rebound Damping assembly if needed	9
	Fork alignment	Visually inspect fork, call Answer Products Customer Service	2
Fork Top out	Loss of Rebound Damping	Replace Rebound Damping assembly	9
	Top out spring damaged	Inspect and replace Top out spring if needed.	10
	Damping oil volume not correct	Check oil level, Replace Rebound Damping assembly if needed	9
Fork Bottom out	Too much SAG	Refer to SAG Set up in Tuning section of Owners Manual	
	Bottom out Bumper damaged	Inspect and replace Bottom out Bumper if needed	11
	Damping oil volume not correct	Check oil level, Replace Rebound Damping assembly if needed	9
Play in Fork	Loose bushings	Replace outer leg	9
	Loose Compression Rod bolt	Tighten bolt to specified torque	10
	Loose Rebound damping shaft	Tighten Shaft to specified torque	9
	Loose press fit tolerances	Call Answer Products Customer Service	2
Dust Seal Blows Out	Oring on Air Assist Piston is damaged	Replace o-ring on Air Assist Compression rod	16
	No/ insufficient Oil on Air Piston	Added oil on top of Air assit piston	16
Lock out not functioning	Various symptoms	See Lock out and RLO Section	13

Axel: Schematic & Technical Specifications



Model: Axel	
Description	**Torque Value**
Bushing Depth - Upper	*8.9mm Min. (.35")
Bushing Depth - Lower	*99 – 106 mm (3.9 - 4.2")
Torque – Brake Post	90–110inlbs (10.2-12.4nm)
Leg Caps	25–35inlbs (2.8-4.0nm)
Torque - Comp Rod Screw	10-30inlb (1.1-3.4nm)
Torque - Damper Screw (Axel Super)	10-30inlb (1.1-3.4nm)
Adjuster caps:	
Torque	35-50inlbs (4.0-5.7nm)
Damping Oil	110 – 120mm (4.3 – 4.7")

Axel Service Kits

		Axel							
Model		**Comp**			**Elite**			**Super**	
Travel (mm)		80	100	120	80	100	120	70-100 RTWD	90-120 RTWD
Comp Damp FFD	**A**	85-5253							
Comp Damp TPC	**A**								
Lock Out - TPC	**A**	*85-5318							
Remote L/O - Lever Left	**A**	*83-2180							
Remote L/O - Lever Right	**A**	*83-2402							
Remote L/O - Cover Left	**A**	*83-2181							
Remote L/O - Cover Right	**A**	*83-2403							
Remote L/O - L/O	**A**	*83-2407							
Remote L/O - Cable	**A**	*83-2182							
Remote L/O - Cable Guide	**A**	*83-2183							
Remote L/O - O-Ring Kit	**A**	*83-2408							
Rbnd Damp - Non Adj	**B**	85-5254			*85-5255				
Rbnd Damp - Adj	**B**	*85-5255			85-5255				
Pre Load Adj	**C**	85-4810							
WD Adjuster Cap Assy	**C**							85-5396	83-2399
Air Assist Cap	**C**	83-2398							
Crn/Str/Leg	**D**								
	Steel S/T (26")	83-2400	83-2117	83-2121	83-2400	83-2117	83-2121	83-2119	83-2123
	Blk AL S/T(26")	*83-2401	*83-2118	*83-2122	*83-2401	*83-2118	*83-2122	*83-2120	*83-2124
Outer Leg Assy	**E**								
STD	Black (26")	83-2127			83-2125				
STD	Silver (26")	83-2129			83-2123				
STD	White	83-2332			83-2339				
STD	Candy Chrome	83-2328							
STD	Candy Red				83-2337				
STD	Matte Black	83-2330							
STD	Charcoal	83-2329							
STD	Matte Silver	83-2331			83-2338				
NB, STD DO	Black (26")	83-2128			83-2126				
NB, STD DO	Silver (26")	83-2130			83-2132				
NB, STD DO	White	83-2327			83-2336				
NB, STD DO	Candy Chrome	83-2324							
NB, STD DO	Candy Red				83-2333				
NB, STD DO	Matte Black	83-2325			83-2334				
NB, STD DO	Matte Silver	83-2326			83-2335				
Sticker Kit	**F - For Dark Colors**	83-2134							
	F - For Light Colors	83-2133							

Axel Service Kits (Cont.)

		Axel							
Model		**Comp**			**Elite**			**Super**	
Travel (mm)		80	100	120	80	100	120	70-100 RTWD	90-120 RTWD
Ride Kits	**G**								
	WD Booster							83-2144	83-2147
	Soft	83-2135	83-2138	83-2141	83-2135	83-2138	83-2141	83-2145	83-2148
	Medium	83-2136	83-2139	83-2142	83-2136	83-2139	83-2142		
	Firm	83-2137	83-2140	83-2143	83-2137	83-2140	83-2143	83-2146	83-2149
Comp Rod/	**H**								
	80	83-2150			83-2150				
	80 Air Asist								
	100		83-2151			83-2151			
	100 Air Asist								
	120			83-2152			83-2152		
	120 Air Asist								
	70-100 RT Wind Down							83-2153	
	90-120 RT Wind Down								83-2153
Bushing Kit	**E**				85-5324				
Knob Kit	**I**	85-5804							
Boot Kit	**J**	85-5390							
Dust Seal Kit	**K**	83-2156			83-2155				
O-Ring Kit	**K**	85-5555							
Bumper Kit	**K**	85-2154							